



A.D. 1862, 5th APRIL. N° 972.

SPECIFICATION

OF

WILLIAM BEGG.

FURNACES FOR CONSUMING SMOKE.

LONDON:

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1862.



A.D. 1862, 5th APRIL. N° 972.

Furnaces for Consuming Smoke.

LETTERS PATENT to William Begg, of Marsh Lane Foundry, Preston, in the County of Lancaster, Iron Founder, for the Invention of “**IMPROVEMENTS IN CONSUMING SMOKE, AND IN FURNACE BARS AND BRIDGES FOR EFFECTING THE SAME.**”

Sealed the 3rd October 1862, and dated the 5th April 1862.

PROVISIONAL SPECIFICATION left by the said William Begg at the Office of the Commissioners of Patents, with his Petition, on the 5th April 1862.

I, WILLIAM BEGG, of Marsh Lane Foundry, Preston, in the County of Lancaster, Iron Founder, do hereby declare the nature of the said Invention for “**IMPROVEMENTS IN CONSUMING SMOKE, AND IN FURNACE BARS AND BRIDGES FOR EFFECTING THE SAME,**” to be as follows :—

My Invention relates to the admission of air heated to a high heat at the bridge of a furnace, in order to produce the combustion of the smoke, and consists in making the furnace bars all hollow from end to end, or nearly so, whereby a great amount of heating surface is obtained to heat the air, and which becomes therein highly heated. The back ends of the bars open into the fire bridge, which I make altogether hollow, and form numerous perforations therein over the crown and in front (towards the furnace) near the top of the bridge. The air may enter at the front ends of the bars direct, or the entrance orifice may be a projection turned down and entering from the ash-

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pit. If the air enters at the end, the dead plate must be made accordingly, while at the back end I form the bridge with a slit to receive and support the ends of the bars. Air thus admitted is highly heated in its passage to the bridge, and when emitted from the perforations in the bridge it mixes with and ignites the smoke, and causes its combustion, thereby effecting a great 5 saving in fuel.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said William Begg in the Great Seal Patent Office on the 4th October 1862.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM 10
BEGG, of Marsh Lane Foundry, Preston, in the County of Lancashire, Iron
Founder, send greeting. ;

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fifth day of April, in the year of our Lord One thousand eight hundred and sixty-two, in the twenty-fifth year of Her 15 reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Begg, Her special licence that I, the said William Begg, my executors, administrators, and assigns, or such others as I, the said William Begg, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter 20 during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVE-
MENTS IN CONSUMING SMOKE, AND IN FURNACE BARS AND BRIDGES FOR EFFECTING
THE SAME," upon the condition (amongst others) that I, the said William Begg, 25 my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said 30 Letters Patent.

NOW KNOW YE, that I, the said William Begg, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the Sheet of Drawings hereunto annexed, and to the 35 letters and figures marked thereon (that is to say) :—

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My Invention relates to the means of admission of air heated to a high heat at the bridge of furnaces, in order to produce the combustion of the smoke, and consists in making all the furnace bars hollow from end to end, or nearly so, and all in one length, whereby a great amount of heating surface is
5 obtained to heat the air, and which becomes highly heated therein. The back ends of the bars open into the fire bridge, which I make altogether hollow, and form numerous perforations therein over the crown and in front (towards the furnace) near the top of the bridge. The air may enter at the front ends of the bars direct, or the entrance orifice may be a projection turned down and
10 entering from the ash-pit. If the air enters at the end, the dead plates must be made accordingly, so as to admit ingress of air to the bars, while at the back end I form the bridge with a slit, to receive and support the ends of the bars. Air thus admitted is highly heated in its passage to the bridge, and when emitted from the perforations in the bridge, it mixes with and ignites the
15 smoke, and causes its combustion, thereby effecting a great saving in fuel.

In order to effect a better distribution of the air and mixture with the products of combustion, I form a series of angular channels across the top of the bridge (that is in the direction of the length of the furnace), which increases the surface area of the bridge top, and permits a larger number of holes to be
20 made therein, and is otherwise conducive to the object desired. I also ridge or serate the tops of the bars across, so that the air may be better distributed in the furnace that enters between the bars.

DESCRIPTION OF DRAWINGS.

Fig. 1 represents a longitudinal vertical section of a Cornish boiler fitted
25 with a furnace, according to my Invention, and Fig. 2, a transverse section of the same on line x, x ; Fig. 3, a separate front view of the bridge; Fig. 4, a lateral vertical section of the same, while Fig. 5 represents a separate view of one of the bars in longitudinal section.

A is the bridge, of somewhat the same form and disposed as in ordinary. I
30 make it of cast iron and hollow throughout, as seen in the sections; the top is V-grooved, and corresponds with the similar form of the interior; the top is thickly studded with numerous perforations for the escape of the air. I also make perforations in the front of the bridge for a like purpose. B, B, are the bars of cast iron, and of the length necessary for the whole length of the
35 furnace, in contradistinction to the usual method adopted of making them in two or more lengths. In this way the bars necessarily require to be deeper and somewhat heavier than if in short lengths, but with this advantage, that more area is provided in the interior for the passage and heating of the air,

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the area of the hollow bars being large the air remains a considerable time within them and allows of its becoming properly heated. A slot C is formed in the front of the bridge to receive the back ends of the bars which rest therein, so that the hollow of the bars have free communication with the hollow of the bridge, while the front ends rest on the dead plate as usual for the free ingress 5 of air to the front ends of the bars. I form a projection on the under side of the bar, so as to permit of an opening of equal or greater area than the transverse section of the hollow in the bar; the air thus admitted enters from the ash-pit, as seen. Instead of entering from below, the hollow channels in the bars may emerge at the ends, and in that case open into a hollow dead plate D, 10 as seen in Fig. 6, air having free ingress to the hollow of the dead plate through numerous perforations made in the underneath side thereof, or it may be admitted through an opening or openings in the front. In furnaces so constructed, air entering and passing through the bars into the fire bridge A becomes highly heated and mixes intimately with the products of combustion 15 when it escapes from the perforations in the bridge, and being ample in quantity, produces the combustion of those products to the greatest possible extent, at same time the bars and bridge are kept cool by the passage of the air. The part H, which separates the ash-pit from the flue is mounted on pivots *i, i*, and can be moved thereon, so as to afford access to the flue and also to the interior 20 of the bridge A.

Having described the nature of my Invention and the manner of performing the same, I would have it understood that I do not claim the exclusive right to the application of hollow bars, or admitting air thereby to the bridge of a furnace to escape and mix with the products of combustion; but what I claim 25 as my Invention, to be protected by the herein-before in part recited Letters Patent, is, the arrangement and construction of furnaces, substantially as and for the purposes herein-before described.

In witness whereof, I, the said William Begg, have hereunto set my hand and seal, this Third day of October, in the year of our Lord 30 One thousand eight hundred and sixty-two.

WILLIAM BEGG. (L.S.)

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FIG. 1.

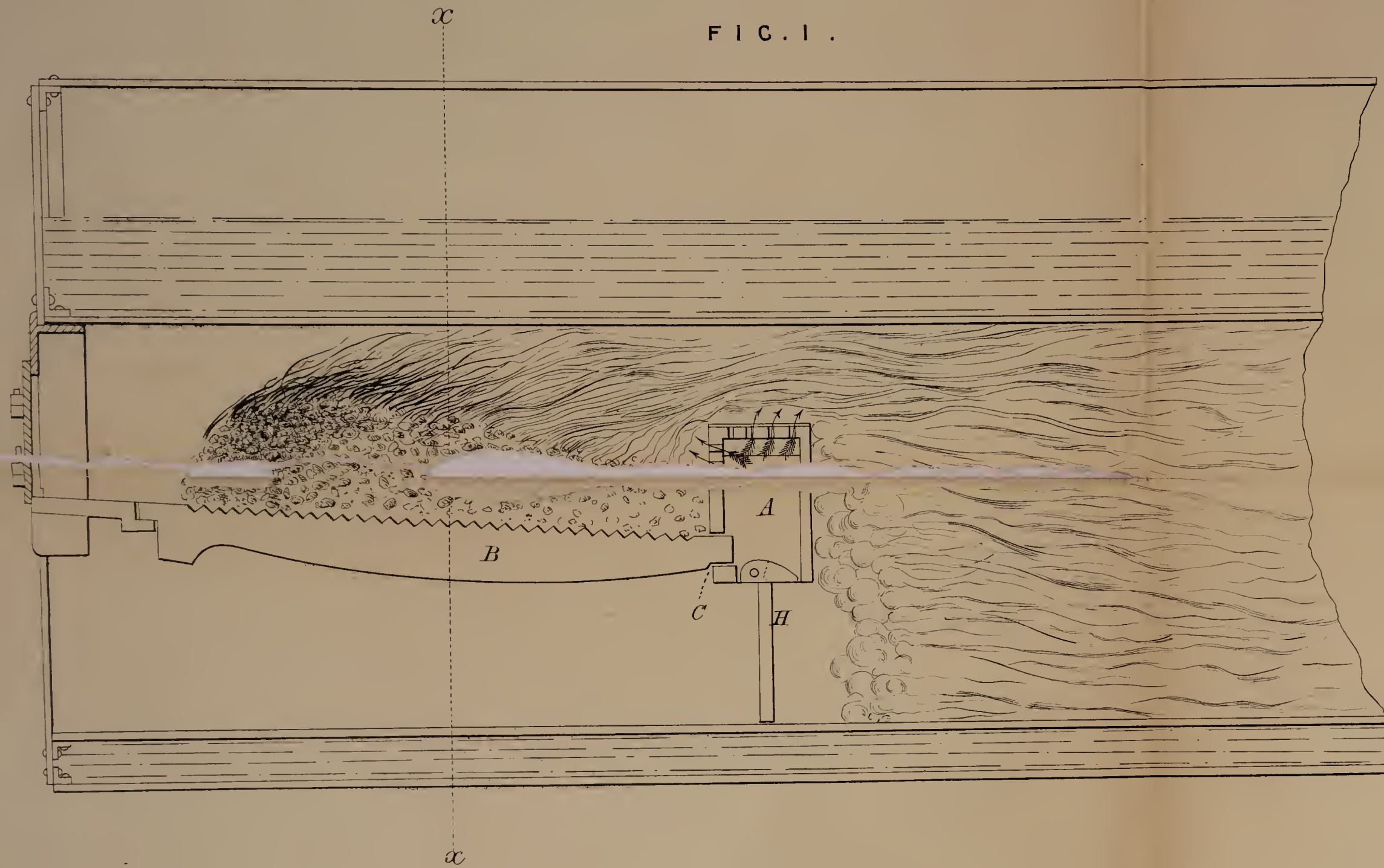


FIG. 2.

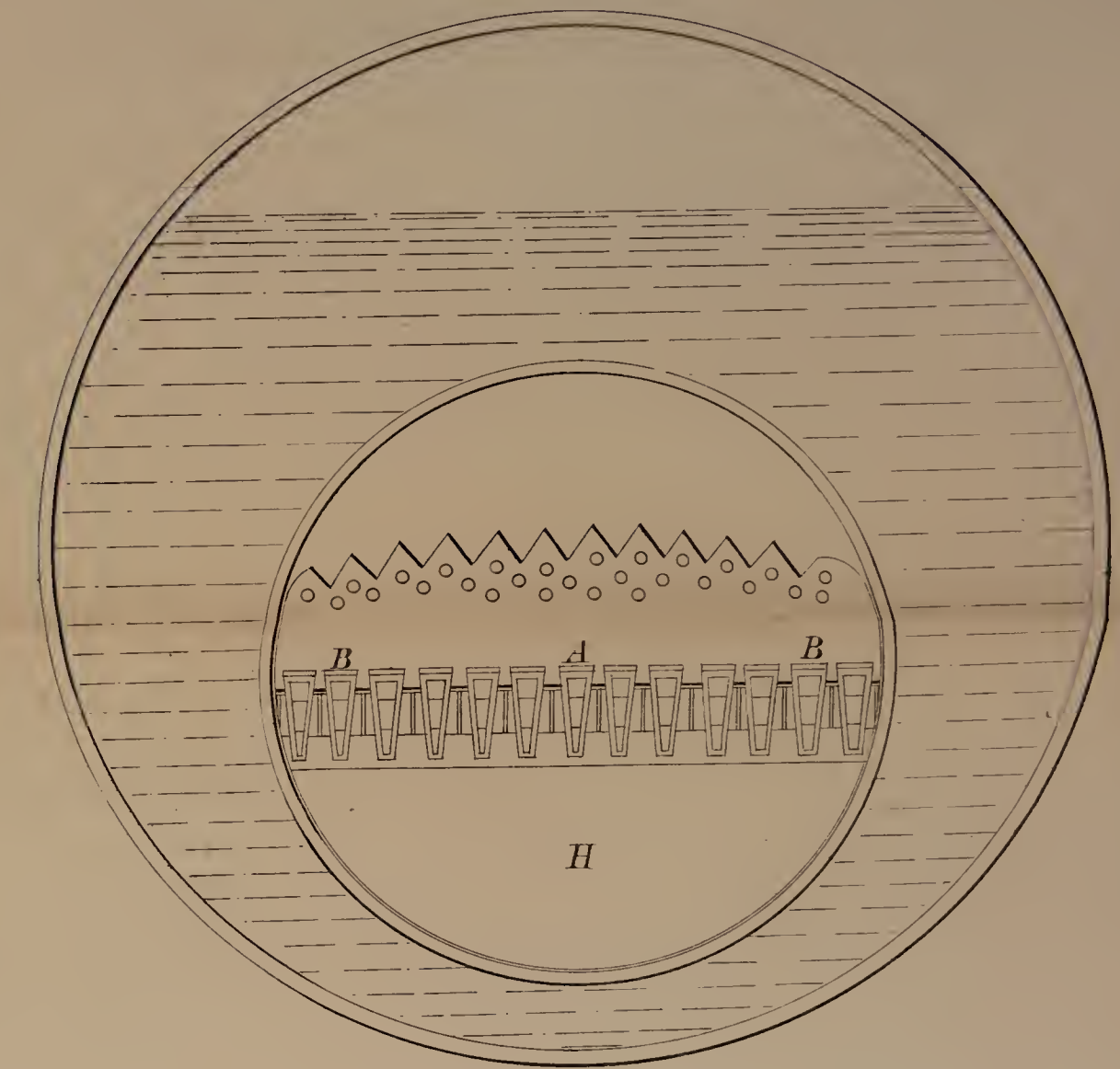


FIG. 3.

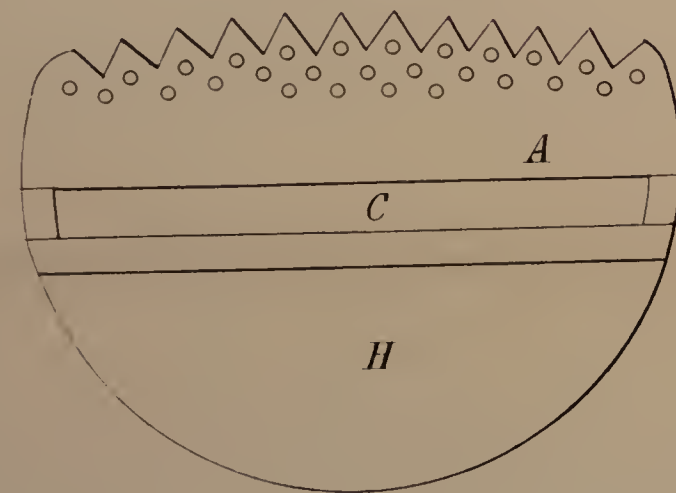


FIG. 4.

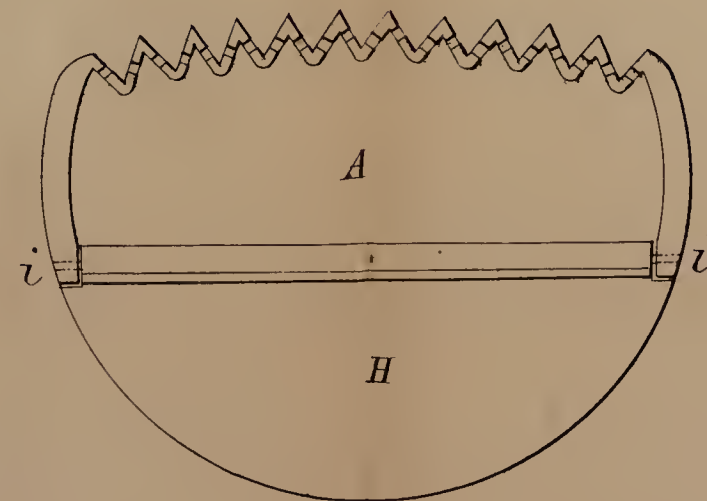


FIG. 5.

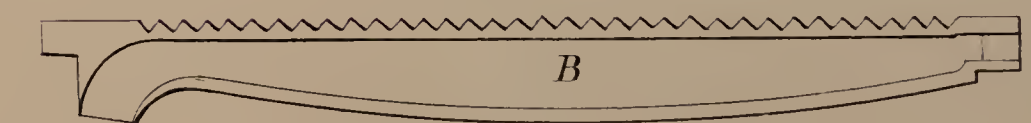


FIG. 6.

